

MARKED-UP VERSION SHOWING CHANGES

In the Specification

Page 1, 1st full paragraph

[In co-pending U.S. provisional patent applications Serial Nos. 60/183,655; 60/183,656; and 60/247,639; prepaints and a method of making paints from these prepaints is described. One of the prepaints is a mixture comprising at least one opacifying pigment, typically titanium dioxide. The other two prepaints may contain either an extender pigment or/and an emulsion polymeric binder. A key requirement for the prepaints is their compatibility with one another so that they may be mixed with each other in various ratios to make at least one paint line. Another key requirement is that the prepaints, whether comprising an opacifying pigment, an extender pigment, or an emulsion polymeric binder, be stable so that the prepaints may be prepared, shipped, and stored without failing, for example, failure by exhibiting non-homogeneity, syneresis, settling, gelling and/or viscosity changes.]

Page 1, last full paragraph:

Hence, there is a need for stable mixtures containing specific combinations and levels of titanium dioxide, thickeners, and dispersants that may be employed, *inter alia*, as prepaints in a method of making paints or as conventional components in other [end-use] end-uses where opacifying pigments are employed, including coatings, impregnants, inks, graphic arts, papers, textiles, caulks, mastics, adhesives, sealants, building products and leather.

Page 7, 2nd full paragraph:

The volume solids content (VS) is the dry volume of pigment(s) plus the dry volume of extender(s) plus the dry volume of binder(s). It is calculated using the formula:

$$VS (\%) = \frac{\text{dry volume of pigment(s)} + \text{dry volume of extender(s)} + \text{dry volume of binder(s)}}{\text{total volume of formulation}} \times 100.$$

If additives are present, their volumes [is] are not included in determining the total dry volume.

Page 7, 4th full paragraph:

The titanium dioxide volume solids content (TiO₂ VS) is the dry volume of TiO₂ pigment(s) plus the dry volume of extender(s) [plus the dry volume of binder(s)]. It is calculated using the formula:

$$\text{TiO}_2\text{VS} (\%) = \frac{\text{dry volume of TiO}_2\text{ pigment(s)}}{\text{total volume of formulation}} \times 100.$$

If additives are present, their volume is not included in determining the total dry volume.

Page 10, lines 1-4:

chloride-acrylic, ethylene-vinyl acetate-acrylic, and urethane polymers, optionally containing up to 10% by weight of functional groups (for example, but not limited to, carboxylic acid, phosphate, sulfate, sulfonate, amide and combinations thereof), other non-functional monomers, and mixtures thereof.

In the Claims

1. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

(a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;

(b) about 0.2 to about 20 lbs/100 gallons of at least one hydrophobically-modified ethylene oxide-urethane polymer (HEUR) thickener selected from the group consisting of:

(i) a HEUR having a C₄-C₁₂ hydrophobe and a molecular weight of about 10,000 to about 200,000,

(ii) a HEUR having a C₆-C₃₀ hydrophobe and a molecular weight of about 10,000 to about 200,000, and

(iii) combinations thereof,

(c) about 1.5 to about 16 lbs/100 gallons of at least one dispersant selected from the group consisting of a maleic acid/diisobutylene copolymer, a butyl methacrylate/methacrylic acid copolymer, and an acrylic acid – hydroxypropyl acrylate copolymer[,]; and

(d) water[,]; wherein the mixture is stable with no mixing required.]

2. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of to about 50 to about 250 KU, which mixture comprises:

(a) about 600 to about 1500 lbs/100 gallons of at least one interior-grade titanium dioxide;

(b) about 0.3 to about 5 lbs/100 gallons of at least one hydrophobically modified, alkali-soluble emulsion (HASE) thickener having a C₆-C₂₂ hydrophobe and a molecular weight of about 10,000 to about 7,000,000;

(c) about 1.8 to about 23 lbs/100 gallons of at least one dispersant selected from the group consisting of a maleic acid/diisobutylene copolymer, a [butylmethacrylate/methacrylic] butyl methacrylate/methacrylic acid copolymer, an acrylic [acid – hydroxypropyl] acid/hydroxypropyl acrylate copolymer, and a polyacrylic acid; and

(d) water[,]; wherein the mixture is stable with no mixing required.]

4. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids

content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
- (b) about 2 to about 6 lbs/100 gallons of at least one hydrophobically-modified hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000;
- (c) about 1.8 to about 23 lbs/100 gallons of at least one polyacrylic acid dispersant; and
- (d) water.[]; wherein the mixture is stable with no mixing required.]

5. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15% and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
- (b) about 0.2 to about 10 lbs/100 gallons of at least one hydrophobically-modified hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000;
- (c) about 2 to about 10 lbs/100 gallons of at least one hydrophobically-modified ethylene oxide-urethane polymer (HEUR) thickener having a C₄-C₃₀ hydrophobe and a molecular weight of about 10,000 to about 200,000;
- (d) about 3.0 to about 22.5 lbs/100 gallons of at least one maleic acid/diisobutylene copolymer dispersant; and
- (e) water.[]; wherein the mixture is stable with no mixing required.]

6. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;

(b) about 0.2 to about 10 lbs/100 gallons of at least one hydrophobically-modified hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000;
(c) about 2 to about 10 lbs/100 gallons of at least one hydrophobically-modified ethylene oxide-urethane polymer (HEUR) thickener having a C₄-C₃₀ hydrophobe and a molecular weight of about 10,000 to about 200,000, (d) about 0.5 to about 22.5 lbs/100 gallons of at least one acrylic [acid – hydroxypropyl] acid/hydroxypropyl acrylate dispersant; and
(e) water; wherein the mixture is stable with no mixing required.]

7. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

(a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
(b) about 1 to about 10 lbs/100 gallons of at least one hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000 or a hydrophobically-modified hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000;
(c) about 0.5 to about 22.5 lbs/100 gallons of at least one acrylic acid – hydroxypropyl acrylate dispersant; and
(d) water; wherein the mixture is stable with occasional mixing required.]

8. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

(a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
(b) about 0.3 to about 5 lbs/100 gallons of at least one hydrophobically-modified, alkali-soluble or alkali-swellaable emulsion (HASE) thickener having a C₆-C₂₂ hydrophobe and molecular weight of about 10,000 to about 7,000,000;

- (c) about 1.2 to about 45 lbs/100 gallons of at least one polyacrylic acid dispersant; and
- (d) water; wherein the mixture is stable with occasional mixing required.]

9. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
- (b) [about 0.5 to about 10 lbs/100 gallons of at least one hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000 or] about 0.5 to about 10 lbs/100 gallons of a hydrophobically-modified hydroxyalkyl cellulose thickener having a molecular weight of about 10,000 to about 10,000,000;
- (c) about 1.2 to about 18 lbs/100 gallons of at least one maleic acid/diisobutylene dispersant; and
- (d) water; wherein the mixture is stable with constant mixing required.]

10. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
- (b) about 0.1 to about 3 lbs/100 gallons of at least one hydrophobically-modified, alkali-soluble or alkali-swellaable emulsion (HASE) thickener having a C₆-C₂₂ hydrophobe and a molecular weight of about 10,000 to about 7,000,000;
- (c) about 0.6 to about 22.5 lbs/100 gallons of at least one acrylic acid – hydroxypropyl acrylate dispersant; and
- (d) water; wherein the mixture is stable with constant mixing required.]

11. (amended once) A fluid opacifying pigment mixture having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids

content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one universal-grade titanium dioxide;
- (b) about 0.1 to about 3 lbs/100 gallons of at least one hydrophobically-modified, alkali-soluble or alkali-swellaable emulsion (HASE) thickener having a C₆-C₂₂ hydrophobe and a molecular weight of about 10,000 to about 7,000,000;
- (c) about 0.6 to about 45 lbs/100 gallons of at least one maleic acid/diisobutylene

copolymer dispersant; and[wherein the mixture is stable with constant mixing required;]

(d) water.

12. (amended once) A fluid opacifying pigment mixture[,] having a titanium dioxide pigment volume concentration of about 40 to about 100%, a titanium dioxide volume solids content of at least about 15%, and a Stormer viscosity of about 50 to about 250 KU, which mixture comprises:

- (a) about 600 to about 1500 lbs/100 gallons of at least one interior-grade titanium dioxide;
- (b) about 0.2 to about 20 lbs/100 gallons of at least one hydrophobically-modified ethylene oxide-urethane polymer (HEUR) thickener selected from the group consisting of[,] a HEUR having a C₄-C₁₂ hydrophobe and a molecular weight of about 10,000 to about 200,000, a HEUR having [hydrophobe] a C₆-C₃₀ hydrophobe and a molecular weight of about 10,000 to about 200,000, and combinations thereof;
- (c) about 1.2 to about 18 lbs/100 gallons of at least one maleic acid/diisobutylene dispersant; and
- (d) water[; wherein the mixture is stable with constant mixing required.]

13. (amended once) The mixture of [Claims 1 to 12] Claims 1, 2, or 4 to 12, which mixture further comprises one or more additives selected from the group consisting of a defoamer, a surfactant, a coalescent, a base, a biocide, a mildewcide, a co-dispersant, a polymeric binder, and a voided latex polymer.

14. (amended once) The mixture of Claim 7, further comprising about 2 to about 12 lbs/100 gallons of at least one hydrophobically-modified ethylene oxide-urethane polymer

(HEUR) thickener having a C₄-C₃₀ hydrophobe and a molecular weight of about 10,000 to about 200,000 or at least one clay thickener.[:]

15. (amended once) The mixture of [claims 1-12] Claims 1, 2, or 4 to 12, wherein the pigment volume concentration is about 50 to 100%.
16. (amended once) The mixture of [claims 1-12] Claims 15, wherein the pigment volume concentration is about 60 to about 100%.
17. (amended once) The mixture of [claims 1-12] Claims 1, 2, or 4 to 12, wherein the pigment volume concentration is about 70 to about 100%.
18. (amended once) The mixture of [claims 1-12] Claims 17, wherein the pigment volume concentration is about 80 to about 100%.
19. (amended once) The mixture of [claims 1-12] Claims 18, wherein the pigment volume concentration is about 90 to about 100%.